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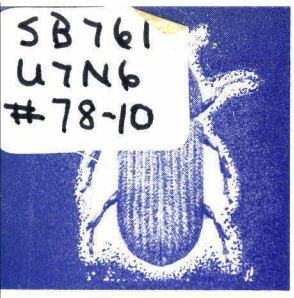

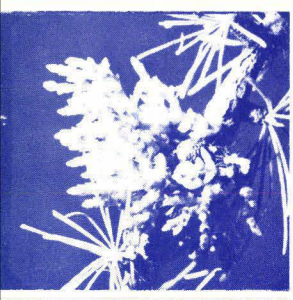

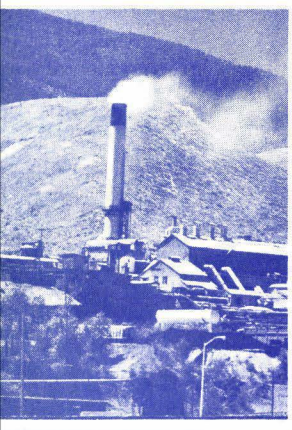

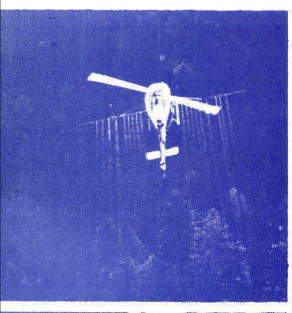

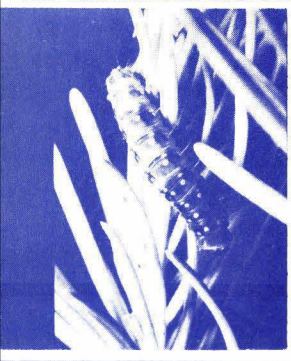

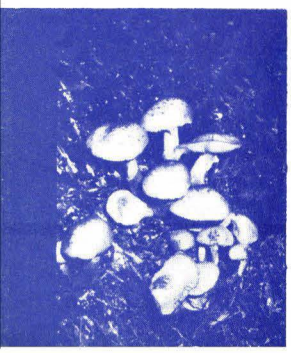

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A PONDEROSA PINE NEEDLE MINER OUTBREAK IN THE FLATHEAD INDIAN RESERVATION AND MISSOULA VALLEY AND POTENTIAL DEFOLIATION FOR 1978

By
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and
Hubert E. Meyer, Biological Technician

INTRODUCTION

Heavy defoliation by a needle miner in ponderosa pine, Pinus ponderosa Laws, was reported in late June 1977 by Steve Haglund, Bureau of Indian Affairs on the Flathead Indian Reservation, Montana. Several defoliated areas were later observed in the Missoula Valley. Aerial surveys in August showed about 10,000 acres were heavily mined, mostly on the Reservation.

Adult moths were identified as a species of Coleotechnites (Lepidoptera: Gelechiidae) by R. W. Hodges, U.S. National Museum, Washington, D.C.

This is the first outbreak of this moth ever recorded in Montana. It's life history and habits resemble those described by Stevens (1973) for a Coleotechnites sp. in ponderosa in Colorado.

The objective of this report is to record what is known about this needle miner in Montana and to report the results of a survey to determine potential defoliation in 1978.

DESCRIPTION OF DAMAGE AND LIFE HISTORY IN MONTANA

Needle mining damage is most obvious during the last part of June. The upper portions of overstory trees were more heavily defoliated, and understory trees were avoided. Previous years' needles (in this case 1976 needles) were preferred, and in very heavily defoliated stands, almost each 1976 needle contained one larva.

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ROCKY MOUNTAIN STATION

Entrance holes were toward the apex of the needle, and larvae mined toward the base. Mines were free of frass, and superficial observations did not detect any silk webbing around entrance (or exit) holes as found by Stevens (1973).

LIFE HISTORY

The needle miner overwinters as a larva inside a needle. On October 17, 1977, larvae were found mining primarily 1977 and some 1976 needles. Entrance holes were near the apex of the needles, and mines extended both directions from the hole. Total mine length was about 1.2 mm at this time. In January 1978, mines were checked again and ranged from 2.5 to 7.0 mm long. Larvae had mined along the mid-rib of the needles toward the base and pushed their frass behind them toward the entrance hole.

Larvae continue feeding in the spring and by the end of June are about full grown. On July 15, 1977, pupae were found inside mined needles near Arlee, Montana, at about 3,800 feet elevation. Adult moths were first detected in cages on trees at this plot on August 17 and were still present on August 30. We did not determine oviposition sites or duration of egg stage. Eggs probably hatch about mid-September.

METHODS

There has been no method developed for predicting trends of this needle miner. Stevens (1973) listed percentage of needles infested by year they were produced. During the fall of 1977, almost all new mines were in 1977 and 1976 needles in Montana. The average percent of 1977 and 1976 needles infested by plot was determined to estimate 1978 population levels.

At each plot, five, 12-inch branch tips were cut with an extendable pole pruner from mid-crown from each of five trees. These branch tips were put in a nylon mesh bag and taken to the laboratory for examination.

From each branch tip, 50 1977 and 50 1976 needles were inspected under a disecting microscope for new mines. Total needles examined per plot was 2500. Percent needles infested per plot was determined. Thirteen plots were sampled (figures 1 and 2).

RESULTS AND DISCUSSION

Percent of needles infested on the 13 sample plots is shown in table 1. Defoliation on the 11 Flathead Indian Reservation plots will probably vary from light to moderate in 1978 based on the percentage of needles mined (table 1). This will be a decrease in damage from 1977 to 1978. Most of the plots showed heavy defoliation in 1977. For instance, from 80 to 95 percent of the 1976 needles were mined on trees in Agency Creek and west of Arlee examined in June 1977. It is doubtful that new areas will be defoliated on the Reservation in 1978.

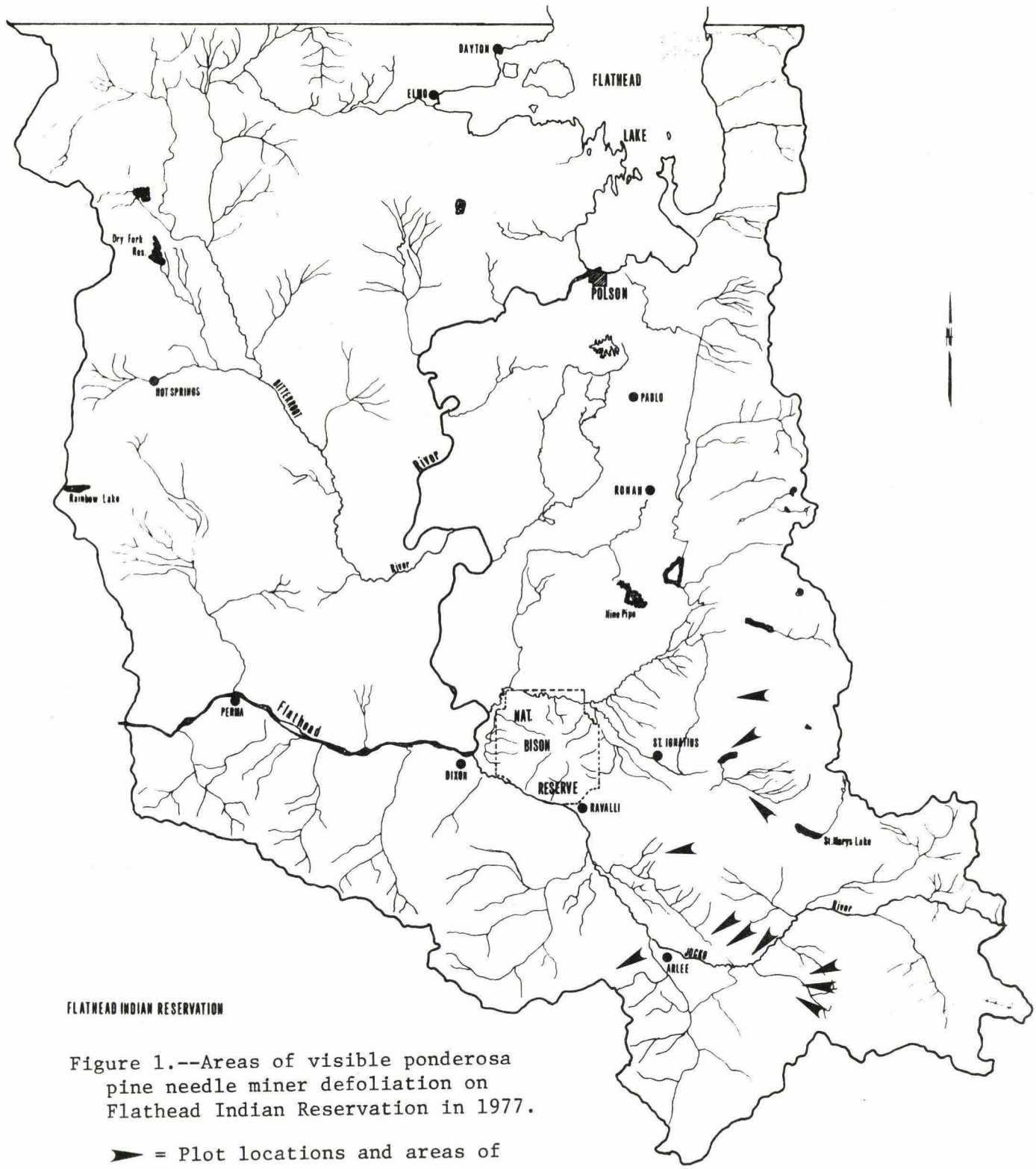

Figure 1.--Areas of visible ponderosa pine needle miner defoliation on Flathead Indian Reservation in 1977.

➤ = Plot locations and areas of defoliation.

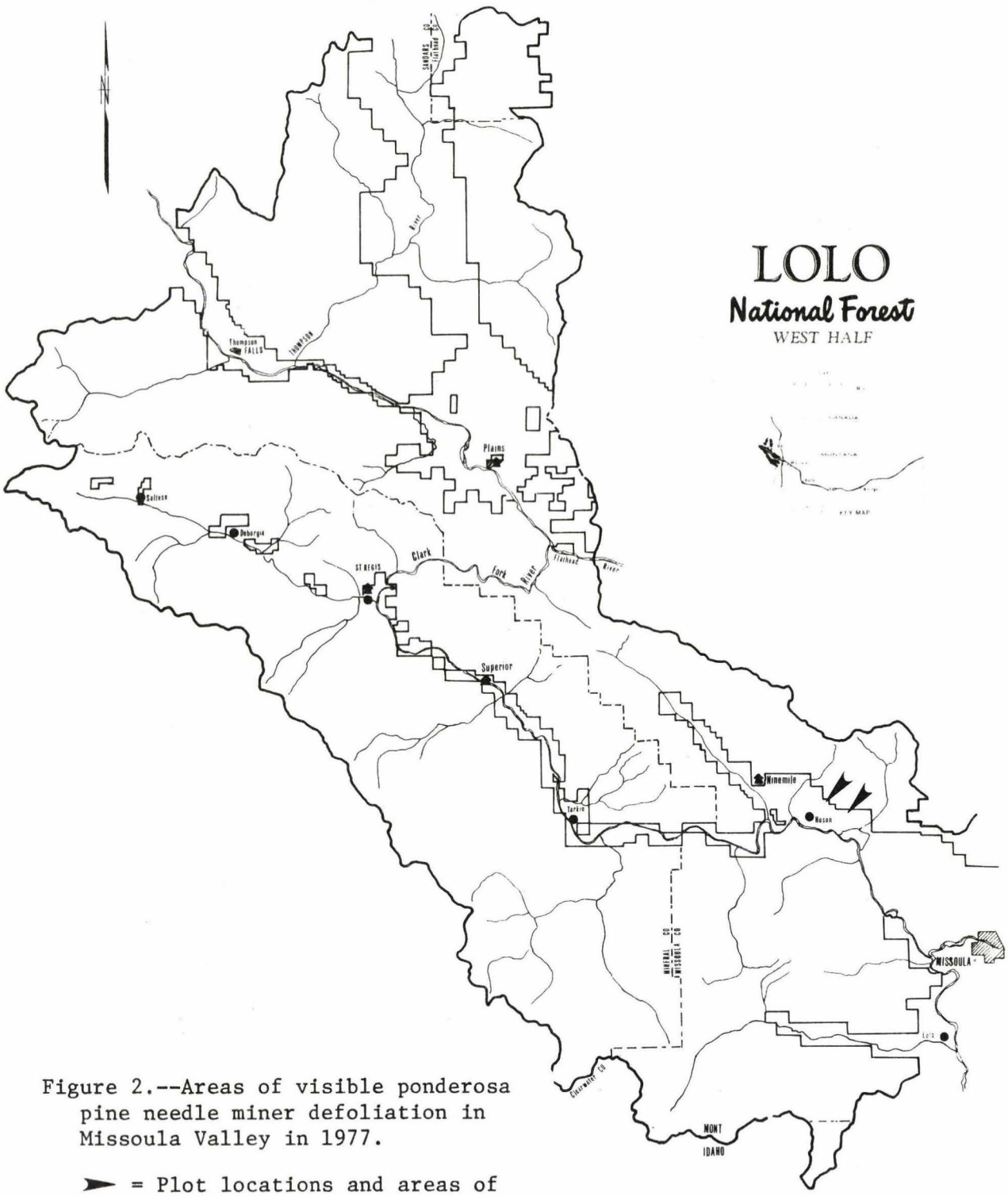

Figure 2.--Areas of visible ponderosa pine needle miner defoliation in Missoula Valley in 1977.

► = Plot locations and areas of defoliation.

Northwest of Missoula, defoliation is expected to be moderate in Roman Creek and heavy in Houle Creek (table 1).

Table 1-- Percentage of needles infested by a ponderosa pine needle miner in the Flathead Indian Reservation and Missoula Valley during January 1978.

Area	Location	Percent needles infested on plot	Potential defoliation in 1978
Flathead Indian Reservation			
Agency Cr.	T.16N., R.19W., S.22	5.2 1/	Light
Ashley Cr.	T.19N., R.19W., S.34	1.9 1/	Light
Jocko River	T.16N., R.19W., S.15	12.3	Moderate
W. of Arlee	T.16N., R.20W., S. 9	17.0 1/	Moderate
N. of Arlee	T.17N., R.20W., S.12	5.1	Light
E. of Arlee	T.16N., R.19W., S. 3	10.4 1/	Moderate
N.E. of Arlee	T.17N., R.19W., S.32	7.7 1/	Light
Stevens Cr.	T.16N., R.19W., S. 4	15.5 1/	Moderate
McClure Cr.	T.16N., R.19W., S.28	10.0 1/	Moderate
Mission Res.	T.18N., R.19W., S.15	3.6 1/	Light
Mikes Cr.	T.18N., R.19W., S.26	6.2 1/	Light
Missoula Valley			
Roman Cr.	T.15N., R.21W., S.21	10.1	Moderate
Houle Cr.	T.15N., R.21W., S.18	26.5 1/	Heavy

1/ Pine butterfly eggs found on needles also.

The Houle Creek infestation has the highest overwintering populations of mining larvae in any of the areas. Visible defoliation may spread in this ponderosa pine stand in 1978.

Enough pine butterfly eggs were found on foliage samples to cause some additional needle loss on 10 plots in 1978. Pine butterfly feeding may cause some needle miner mortality.

More information on the biology and natural mortality of this needle miner will be collected during 1978 season.

REFERENCE CITED

Stevens, R. E., 1973. A ponderosa pine needle miner in the Colorado Front Range. USDA, Forest Service, Rocky Mtn. For. & Range Exp. Sta., Fort Collins, Colo. Res. Note RM-228, 3 p.